



PHYSICS NMDCAT

TOPIC WISE TEST (UNIT-1)

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SAEED MDCAT TEAM

TOPICS:

✓ **Force and Motion**

- Q. 1** A cricket ball is hit so that it travels straight up in air and it acquires 3 seconds to reach the maximum height. Its initial velocity is
A. 10ms^{-1} B. 15ms^{-1}
C. 29.4ms^{-1} D. 12.2ms^{-1}
- Q. 2** Laws of motion are not valid in a system which is
A. Moving with uniform velocity B. At rest
C. Isolated D. Non-inertial
- Q. 3** When the projectile reaches the highest point of trajectory, the vertical component of velocity becomes
A. Small B. Maximum
C. $\text{Vicos}\theta$ D. Zero
- Q. 4** The area between velocity time graph and the time axis is numerically equal to
A. Speed of object B. Distance covered by the object
C. Average velocity of the object D. Acceleration of the object
- Q. 5** The slope of velocity time graph gives
A. Speed B. Force
C. Temperature D. Acceleration
- Q. 6** A force of 10 N acts on a body of mass 1 kg for 5 sec to a distance of 10 m. The rate of change of momentum is:
A. 50 N B. 25 N
C. 20 N D. 10 N
- Q. 7** Height of projectile is maximum at an angle of:
A. 45° B. 60°
C. 30° D. 90°
- Q. 8** Which shows correct relation between H and T of projectile?
A. $H = \frac{2T^2}{8}$ B. $H = \frac{gT^2}{8}$
C. $H = \frac{8g}{T^2}$ D. $H = \frac{8}{gT^2}$
- Q. 9** A runner runs 100m in 10s, then turns around and jogs 50m back toward the starting point in 30s. What is his average speed and average velocity in m/s.
A. 3, 1.25 B. 3.75, 1.25
C. 4.25, 1.25 D. 3, 1
- Q. 10** For range to have maximum value, the function $\sin 2\theta$ should have value
A. 90 B. 1
C. 45 D. 0
- Q. 11** A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is
A. 2g, down B. g, up
C. Zero D. g, down
- Q. 12** If R is the max range of projectile, then greatest height attained is



A. R

B. $\frac{R}{4}$

C. $R/2$

D. $2R$

Q. 13 A projectile is thrown at 45° , its range is 90 m what is its initial velocity

A. 10 ms^{-1}

B. 50 ms^{-1}

C. 30 ms^{-1}

D. 90 ms^{-1}



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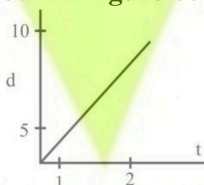
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- Q. 14** If the slope of displacement-time graph increases, then
 A. Acceleration decreases
 B. Velocity increases
 C. Speed decreases
 D. None of these
- Q. 15** A body travels 4 m due north and then turns east and travels 3 m due east. the displacement of the body is:
 A. 7 m
 B. 5 m
 C. 1 m
 D. 3.5 m
- Q. 16** A body of momentum mv collides with a wall elastically its change in momentum is
 A. mv
 B. 0
 C. $-2mv$
 D. mv
- Q. 17** Time of flight of projectile is
 A. $\frac{v_i \sin \theta}{g}$
 B. $\frac{2v_i \sin \theta}{g}$
 C. $\frac{v_i \sin 2\theta}{g}$
 D. $\frac{v_i^2}{g}$
- Q. 18** The horizontal component of velocity of projectile moving with initial velocity of 250m/s at an angle 60° with x-axis is
 A. 500 m/s
 B. 1000 m/s
 C. 125 m/s
 D. Zero
- Q. 19** A particle at rest suddenly disintegrates into two particles of equal masses which start moving. The two fragments will.
 A. Move opposite with unequal speeds
 B. Move in any direction with any speed
 C. Move in same direction with equal speeds
 D. Move opposite with equal speed
- Q. 20** If a tennis ball moving with velocity 15 ms^{-1} collides elastically with a wall then velocity of tennis ball after collision will be _____
 A. 15 ms^{-1}
 B. 30 ms^{-1}
 C. -15 ms^{-1}
 D. -30 ms^{-1}
- Q. 21** Displacement time graph is shown in figure below acceleration will be



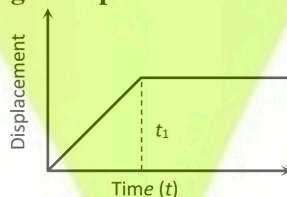
- A. 5 ms^{-2}
 B. 10 ms^{-2}
 C. 2.5 ms^{-2}
 D. 0
- Q. 22** A car of mass 1000 kg moving with 25 ms^{-1} collide straight with stationary truck of mass 1500 kg, and start moving together. Find the velocity of truck.
 A. 15 ms^{-1}
 B. 25 ms^{-1}
 C. 10 ms^{-1}
 D. 6 ms^{-1}
- Q. 23** Force is measured according to which law of motion
 A. 1st
 B. 3rd
 C. 2nd
 D. All
- Q. 24** For two colliding balls which condition is applicable for one dimensional elastic collision
 A. They should be non-rotating
 B. They should be smooth
 C. They should be massive
 D. Both A & B
- Q. 25** If the slope of velocity-time graph gradually decreases, then the body is said to be moving with:
 A. Positive acceleration
 B. Negative acceleration
 C. Uniform velocity
 D. Zero acceleration
- Q. 26** A 7.0-kg bowling ball experiences a net force of 5.0 N. What will be its acceleration?
 A. 35 m/s^2
 B. 7.0 m/s^2
 C. 5.0 m/s^2
 D. 0.71 m/s^2



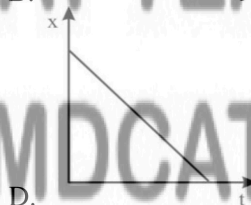
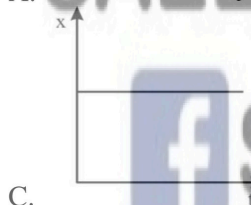
- Q. 27 A projectile is launched at 45° to the horizontal with an initial kinetic energy E. Assuming air resistance to be negligible what will be the kinetic energy of the projectile when it reaches its highest point?
- A. 0.50 E
B. 0.71E
C. 0.70E
D. E
- Q. 28 To improve the jumping record the long jumper should jump at an angle of
- A. 30°
B. 45°
C. 60°
D. 90°
- Q. 29 Range of a projectile on a horizontal plane is same for the following pair of angles:
- A. 15° and 18°
B. 43° and 47°
C. 20° and 80°
D. 52° and 62°
- Q. 30 A body moves from point P (3, 4) to Q (5, 7). Its displacement vector would be
- A. $8\hat{i} + 10\hat{j}$
B. $8\hat{i} + 2\hat{j}$
C. $2\hat{i} - 2\hat{j}$
D. $2\hat{i} + 3\hat{j}$
- Q. 31 The relation " $\frac{\Delta x}{\Delta t}$ " gives definition of
- A. Instantaneous velocity
B. Uniform velocity
C. Constant velocity
D. Average velocity
- Q. 32 A body covers displacement of 50 m in 2 sec and then next 50m in 1 sec Magnitude of its average velocity would be
- A. 0
B. 23.3 m/sec
C. 33.3 m/sec
D. None of these
- Q. 33 If Δt made smaller and smaller till it approaches to zero than the relation " $\frac{\Delta v}{\Delta t}$ " gives
- A. Uniform acceleration
B. Average acceleration
C. Instantaneous acceleration
D. Positive acceleration
- Q. 34 The magnitude of acceleration produced in an object is inversely proportional to the (if force is constant):
- A. Momentum
B. Mass
C. Velocity
D. Force
- Q. 35 Mathematically form of Newton's 2nd law of motion:
- A. $F = \frac{a}{m}$
B. $F = \frac{m}{a}$
C. $F = ma^2$
D. $F = ma$
- Q. 36 The collision in which K.E does not conserve before and after is called:
- A. Perfectly elastic
B. Perfectly inelastic
C. Nearly elastic
D. Nearly inelastic
- Q. 37 When two bodies of equal masses collide with one another then
- A. They will move with same velocities
B. They will interchange their velocities
C. Their direction reverses but magnitude of velocities remains same
D. None of these
- Q. 38 A car runs at constant speed on a circular track of radius 100 m taking 62.8 sec on each lap. What is the average speed and average velocity on each complete lap?
- A. Velocity 10 m/sec, speed 10 m/sec
B. Velocity zero, speed zero
C. Velocity zero, speed 10 m/sec
D. Velocity 10 m/sec, speed zero
- Q. 39 Angle between action and reaction forces is
- A. 0°
B. $\frac{\pi}{2}$ rad
C. π rad
D. 2π rad
- Q. 40 A person sitting in an open car moving at constant velocity throws a ball vertically up into air. The ball falls
- A. Outside the car
B. In the car ahead of the person
C. In the car to the side of the person
D. Exactly in the hand which threw it up



- Q. 41 A force of 100 dynes acts on mass of 5 gm for 10 sec. The velocity produced is
A. 2 cm/sec
B. 20 cm/sec
C. 200 cm/sec
D. 2000 cm/sec
- Q. 42 In doubling the mass and acceleration of the mass, the force acting on the mass with respect to the previous value
A. Decreases to half
B. Remains unchanged
C. Increases two times
D. Increases four times
- Q. 43 A vehicle of 100 kg is moving with a velocity of 5 m/sec. To stop it in $\frac{1}{10}$ sec, the required force in opposite direction is
A. 5000 N
B. 500 N
C. 50 N
D. 1000 N
- Q. 44 When we jump out of a boat standing in water it moves
A. Forward
B. Backward
C. Sideways
D. None of the above
- Q. 45 Action and reaction forces act on
A. The same body
B. The different bodies
C. The horizontal surface
D. Nothing can be said
- Q. 46 If a force of 250 N act on body, the momentum acquired is 125 kg-m/s. What is the period for which force acts on the body?
A. 0.5 sec
B. 0.2 sec
C. 0.4 sec
D. 0.25 sec
- Q. 47 The $x-t$ graph shown in figure represents



- A. Constant velocity
B. Velocity of the body is continuously changing
C. Instantaneous velocity
D. The body travels with constant speed upto time t_1 and then stops
- Q. 48 When force of 1N is applied on a body of mass 100g then the acceleration would be
A. 5ms^{-2}
B. 10ms^{-2}
C. 0.5ms^{-2}
D. 0.1ms^{-2}
- Q. 49 Which of the following cannot be distance time graph



- Q. 50 An object describe its motion as 20 m/s in 4 s, 23 m/s in 7 s and 26 m/s in 10 s then its velocity is said to be
A. Variable
B. Instantaneous
C. Uniform
D. Relative



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Range

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